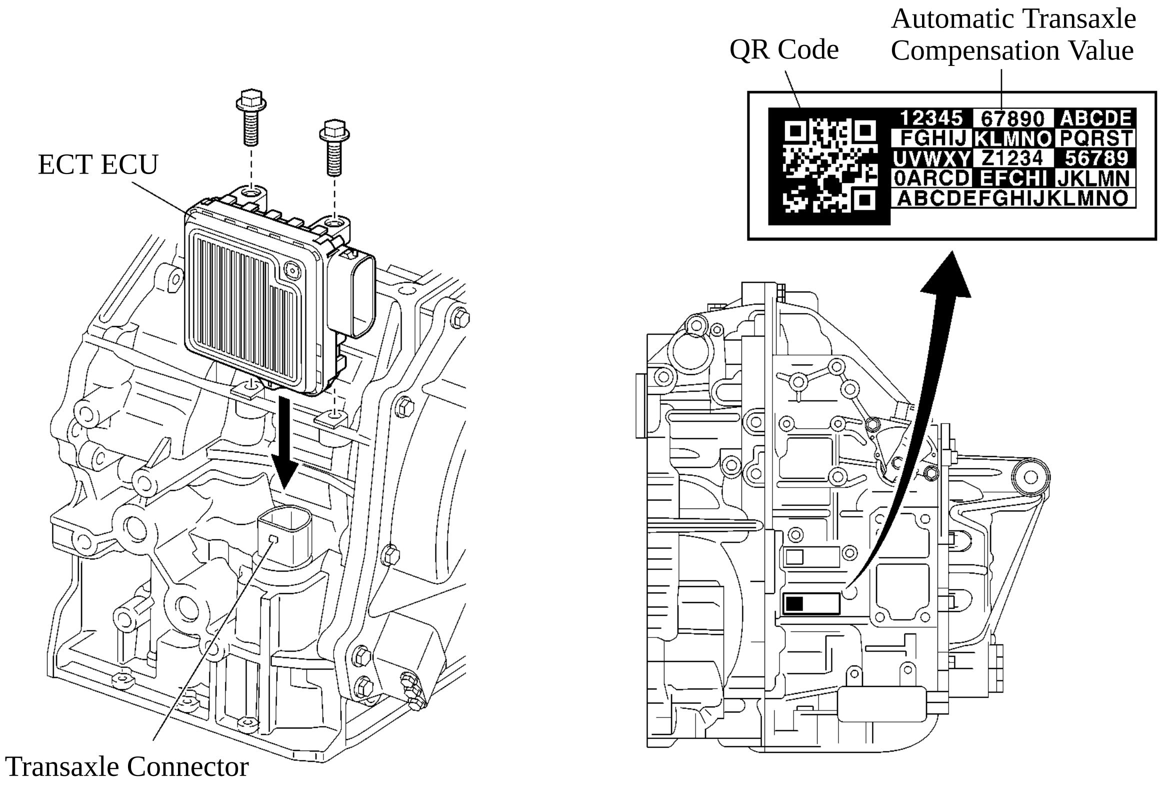
4. Construction and Operation of Main Components

ECT ECU

- The ECT ECU has been isolated from the ECM and directly fitted to the transaxle. Thus, the wiring harness has been shortened allowing the weight to be reduced. All the solenoid valves and sensors used for automatic transaxle control are directly connected to the ECT ECU through the connector located in front of the automatic transaxle.
- The ECT ECU maintains communication with the ECM through the CAN (Controller Area Network). Thus, engine control is effected in coordination with ECT control.
- A label, on which the automatic transaxle compensation values and QR (Quick Response) code are printed, is attached on the top of the automatic transaxle. The label contains encoded automatic transaxle property information. When the automatic transaxle is replaced, allow the ECT ECU to learn the automatic transaxle property information by inputting the automatic transaxle compensation values into the ECT ECU using a hand-held tester. In this way, the shift control performance immediately after replacement of the automatic transaxle is improved. For details, see the 2007 LEXUS ES350 Repair Manual (Pub. No. RM01Y0U).
- The QR code, which requires a special scan tool, is used at the vehicle assembly plant.



Transaxle Top View

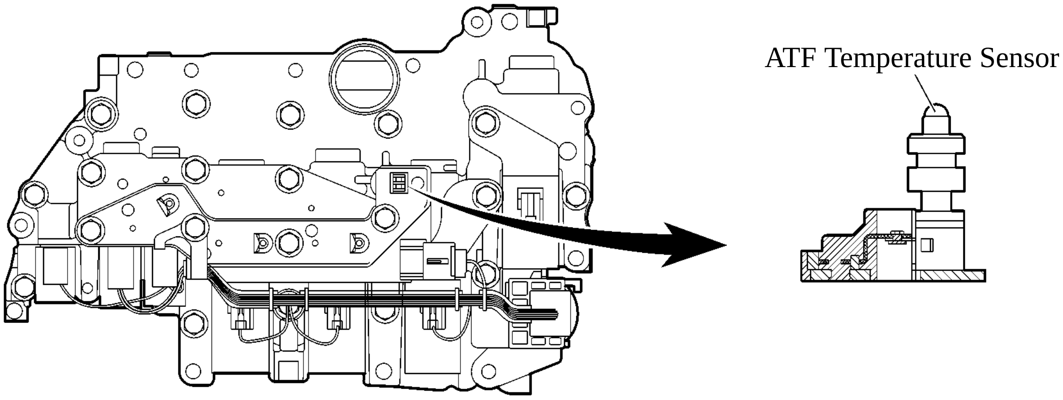
— REFERENCE —

What are QR (Quick Response) Codes?

- *QR code, a matrix symbology consisting of an array of nominally square cells, allows omni-directional, high-speed reading of large amounts of data.*
- *QR codes encode many types of data such as numeric, alphanumeric, kanji, kana and binary codes. A maximum of 7,089 characters (numeric) can be encoded.*
- *QR codes (2D code) contain information in the vertical and horizontal directions, whereas bar codes only contain data in one direction. QR codes (2D code) hold considerably greater volumes of information than bar codes.*

ATF Temperature Sensor

- The ATF temperature sensor is installed in the valve body for direct detection of the fluid temperature.
- The ATF temperature sensor is used for the revision of clutch and brake pressures to maintain a smooth shift quality every time.



Lower Valve Body

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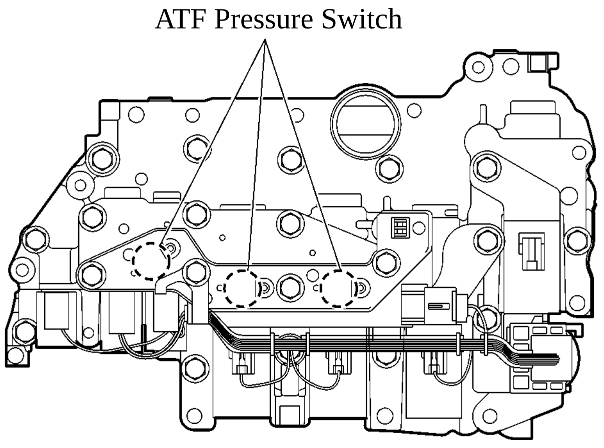
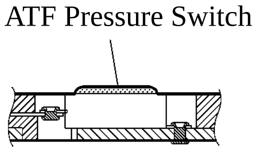
ATF Pressure Switch

- The ATF pressure switches are located in the output fluid passages of SL1, SL2 and SLU, and turn ON/OFF in accordance with the solenoid valve output fluid pressure.
- The ECT ECU detects malfunctions in solenoid valves SLU and SL used in lock-up control in accordance with the ON/OFF signals from ATF pressure switch 3 located in the SLU output fluid passage.
- When any of SL1 to SL4 malfunctions, the ECT ECU determines the appropriate fail-safe operation to be actuated in accordance with the ON/OFF signals from ATF pressure switches 1 and 2 located in the SL1 and SL2 output fluid passages.



Lower Valve Body



ATF Pressure Switch Cross-Section

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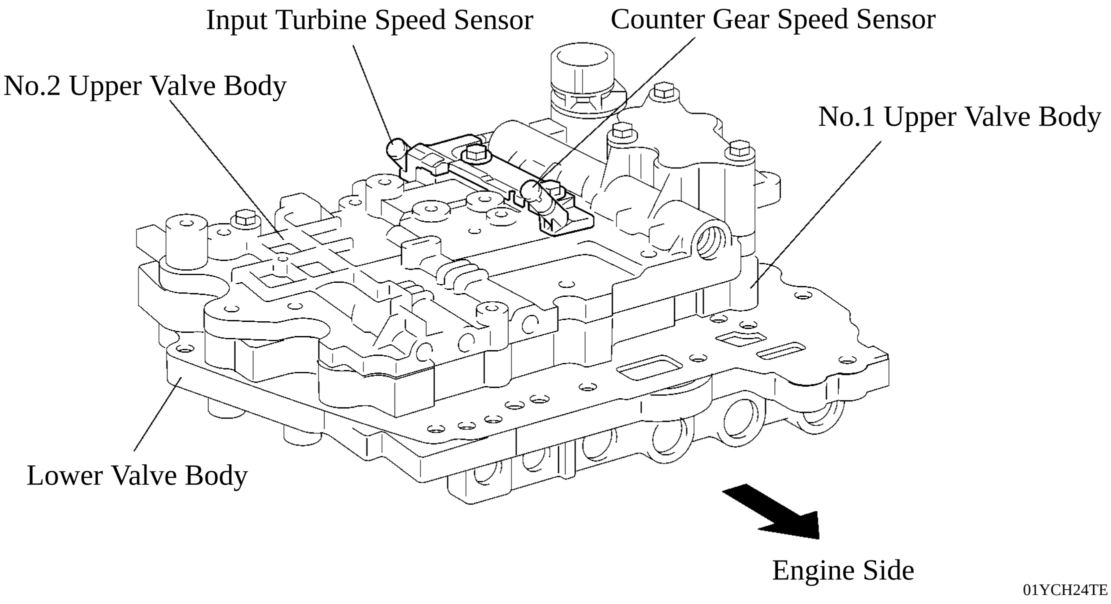
Speed Sensors

- The U660E automatic transaxle uses an input turbine speed sensor (for the NT signal) and a counter gear speed sensor (for the NC signal). Thus, the ECT ECU can detect the timing of the shifting of the gears and appropriately control the engine torque and hydraulic pressure in response to the various conditions. These speed sensors are the Hall type.
- The input turbine speed sensor detects the input speed of the transaxle. The No.2 clutch piston is used as the timing rotor for this sensor.
- The counter gear speed sensor detects the speed of the counter gear. The counter drive gear is used as the timing rotor for this sensor.
- The Hall type speed sensor consists of a magnet and Hall IC. The Hall IC converts the changes in the magnetic flux density that occur through the rotation of the timing rotor into electric signal, and outputs the signal to the ECT ECU.

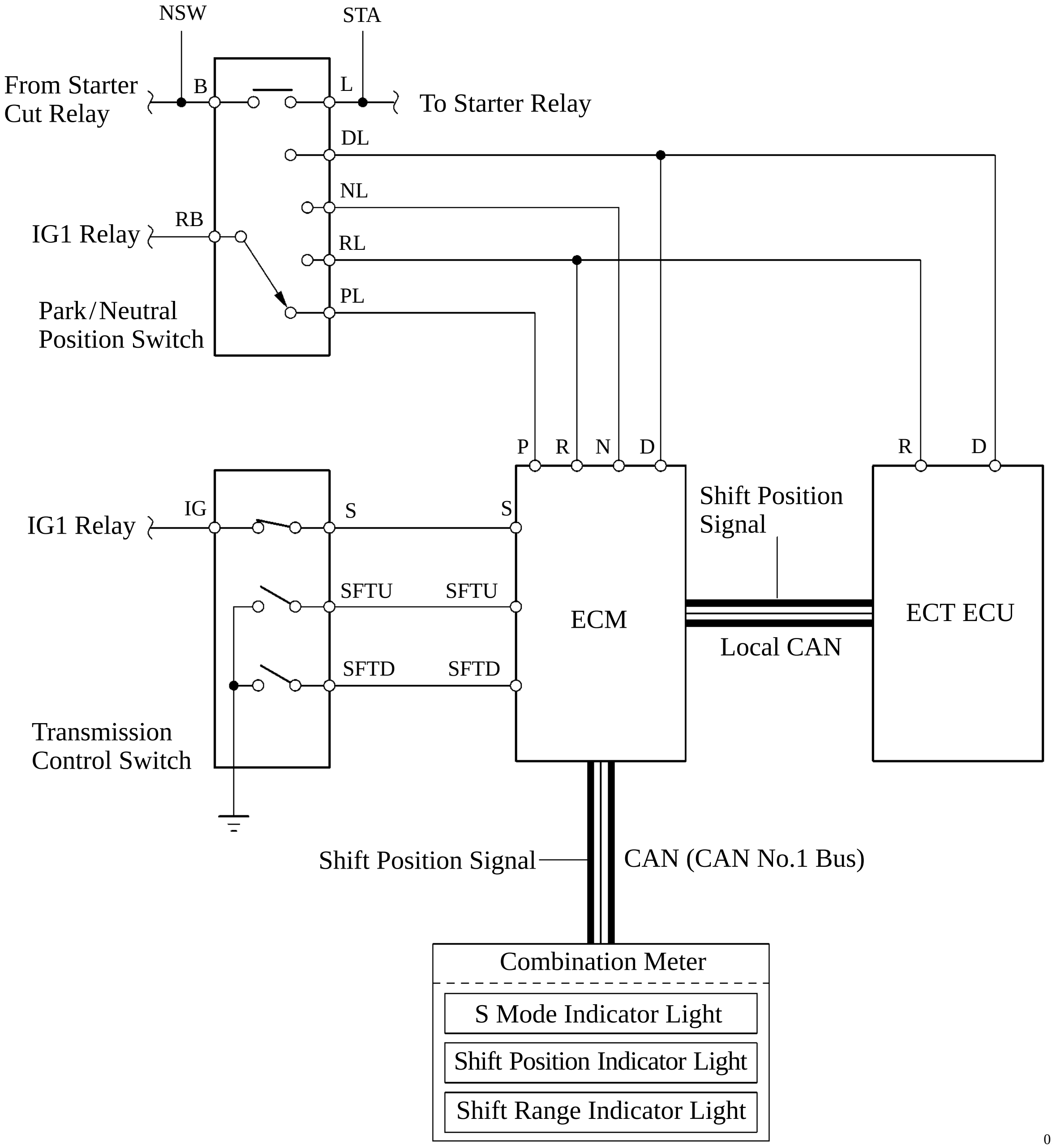


Transmission Control Switch and Park/Neutral Position Switch

The ECT ECU and ECM use these switches to detect the shift lever position.

- The park/neutral position switch sends the P, R, N and D position signals to both the ECM and ECT ECU. The ECM transmits signals to the combination meter for the shift position indicator light (P, R, N and D) in response to the signal it receives from the switch.
- The transmission control switch is installed inside the shift lever assembly. Switch terminal S is used to detect whether the shift lever is in the D position or S mode position, and terminals SFTU and SFTD are used to detect the operating conditions of the shift lever (front [+ position] or rear [- position]) if S mode is selected. By transmitting signals to the ECM, the transmission control switch turns on both the shift range indicator light and S mode indicator light when the shift lever is moved to the S mode position, and indicates the selected range position through shift range indicator light.

▶ Wiring Diagram ◀



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